

## What is a Methods and Materials Section?

A detailed account of the methods you used to gather data/ information throughout your study, as well as the materials you used, the research setting and conditions, controls, limitations, and any theoretical frameworks.

### Why are Methods and Materials Important? What Should I Address?

- ✓ Describes the **research process**, i.e. the choices you made, why you made those choices, and the outcomes of making those choices.
- ✓ Offers a **rationale** for your decisions and materials selection, i.e. provides a justification for the decisions you made and why you thought these were the best decisions for your research.
- ✓ Provides an opportunity to recap the **central research questions** of the project and to explain how you went about answering those questions. This allows readers to determine more easily and transparently whether your decisions were the optimal strategies for deduction (and/or whether future research needs to be adapted for more accurate results).
- ✓ Provides a more comprehensive and **empirical record** as to how you obtained the project results. This means that the study can be replicable, i.e. other scholars can repeat your steps for future research, as well as critique and/or develop on those strategies.
- ✓ Presents a clear **statement of limitations**, i.e. no study can be 100% comprehensive in any field and must necessarily be limited to some extent in its focus/ objectives. A statement of your limitations helps your reader understand the scope of the research, and what the project does and does not cover.
- ✓ Explains the selected/ guiding **theoretical frameworks** (where applicable) that you have chosen. This helps the reader understand the broader trends in thinking that are guiding the project. In this sense, the Methods and Materials section works concomitantly with your Literature Review. Please see the UCD Writing Centre's handout on Literature Reviews for more information.
- ✓ Provides another opportunity to convince the reader of the **validity of the works and the results**, i.e. because the reader can see that you made the best choices you could in the given conditions.
- ✓ Addresses any **ethical issues** that may have emerged when formulating the research/ systems design.

### Methodological Questions to Ask Yourself:

\*NOTE: these questions also apply to the materials you chose, as well as the research setting in which you worked.

- ✓ **Justification:** Why was this particular methodology chosen?
- ✓ **Contribution:** How does this methodology provide new information on the subject?
- ✓ **Originality:** In what ways is the methodology novel or ground-breaking?
- ✓ **Gaps:** Could the methodology be improved? Are there any oversights?
- ✓ **Limitations:** Does the chosen methodology present any major or minor limitations?
- ✓ **Reproducibility:** Can my research design be reproduced by someone else?

- Adapted from Lynne Pearce, *How to Examine a Thesis*, 2005.

### Quick Tips: Writing Style

\*NOTE: See also the UCD Writing Centre's handout on style tips for scientific writing.

- This section should be very straightforward and concise.
- Vary your use of terminology and phrasing as much as possible, i.e. avoid repetition.
- Avoid excessive wording ('wordiness').
  - *E.g.* "Rather than saying: **As we let x become closer and closer to 0, then y tends ever close to t0**, instead say: **When x is close to 0 then y is close to t0**" (Steven G. Krantz, *A Primer of Mathematical Writing*, 2002.).
- Draw from a range of discourse markers and rhetorical strategies. See the UCD Writing Centre's handout on writing transitions for more information.
- Avoid inadvertent use of casual or overused phrases or sentence structures.
- Incorporate a balanced use of both the passive voice and the active voice (see below).

|                           | Passive Voice   | Active Voice   |
|---------------------------|---|--|
| <b>Function</b>           | Tells us what is done to a person/ thing, i.e. the subject of the sentence is being acted <i>upon</i> . | Tells us what a person/ thing does, i.e. the subject of the sentence <i>performs</i> the action on the object. |
| <b>Sentence Structure</b> | Object + Verb + Subject.  | Subject + Verb + Object.   |
| <b>Example 1</b>          | Method A was done.<br>Then Method B was done.   | Method A provided X.<br>Subsequently, Method B achieved Y.   |
| <b>Example 2</b>          | To ensure sampling was completed on schedule, Procedure B was chosen as the most efficient.             | Chosen for efficiency, Procedure B ensured sampling was completed on schedule.                                 |

## Scientific Writing: Improving a Methods Statement

*Quite vague, i.e. does not explain or justify **why** these choices were made.*

**✗ First Draft:**

Sampling procedures were implemented on a test group to determine which procedure would be utilised for this study. Procedure B was decided to be implemented. Sampling of the data groups was initiated. When the sampling was completed, the groups were divided into subgroups. Statistical models were implemented (to organise the subgroups to identify qualifiable result patterns).

*Overuse of the passive voice throughout. The second example here also makes the sentence very awkward.*

*Falling into the trap of 'wordiness'. This can be simplified.*

*Good use of the active voice. Remember, students often overuse the passive voice in this section. A balance between the two is best.*

**✓ Second Draft:**

After examining all available procedures on a test sample, Procedure B proved the best option for sampling all data groups because it provided X and Y. Once sampling was completed, statistical models informed the organisation into subgroups, which more accurately identified qualifiable result patterns.

*Justifying + providing explanations for the choices made.*

*Syntax is more concise because it follows a simpler structure of: subject + verb + object.*